

REMARKS

Amendments

Claim 1 has been amended to clarify that in one step an iodine atom-containing intermediate polymer is obtained by radically polymerizing a mixture of ethylenically unsaturated monomers in the presence of a radical precursor and I₂ or a iodine chain transfer agent and that in a different step a block or gradient final (co)polymer is obtained by radically polymerizing a mixture of ethylenically unsaturated monomers in the presence of a radical precursor and the iodine atom-containing intermediate polymer. Support for this clarifying amendment can be found in the Specification at page 10, lines 4-15. The applicants additionally note that while the steps of claim 1 are enumerated “first” and “second,” the Specification (page 10, lines 14-15) provides that the second step may be started before the first step is ended.

Claims 1 and 10 have been amended to recite that the end group of the intermediate polymer(s) predominantly is of the iodine-containing methacrylate type. Support for these amendments can be found in the Specification at page 5, line 18 to page 6, line 17, in particular page 6, lines 1-7. Claim 10 has also been amended to address the Examiner’s rejection under 35 U.S.C. § 112, by deleting the language “and is obtainable from a polymerization of ethylenically unsaturated monomers.”

Claim 3 has been amended to clarify that at least one of the polymerization of the first step or the polymerization of the second step occurs at a temperature lower than about 130°C. The amended claim would not exclude both polymerizations occurring at a temperature(s) lower than about 130°C. Support for this clarifying amendment can be found in the Specification at page 10, lines 22-25.

Claims 10 and 11 have been amended in one instance each to replace “polymer” with “polymer(s)” in recognition that the recited methods can employ either an iodine atom-containing intermediate polymer or a mixture of iodine atom-containing intermediate polymers.

Claims 26 and 31 have been amended to address the Examiner’s rejection under 35 U.S.C. § 112, by replacing “obtainable” with “obtained.”

Support for new claims 36 and 40 can be found in the Specification at page 6, lines 6-12.
Support for new claims 37 and 41 can be found in the Specification at page 6, lines 21-23.
Support for new claims 38 and 42 can be found in the Specification at page 6, lines 17-19.
Support for new claim 39 can be found in the Specification at page 8, lines 1-5.

Rejections

Rejections and Objections under 35 U.S.C. § 112

Claims 10-19 and 26-35 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Examiner’s rejection appears to be directed to the use of the word “obtainable” in claims 10, 26, and 31. The remainder of the rejected claims depend from these three claims.

In response, Applicants have deleted the offending statement from claims 10, 26, and 31. In the case of claims 26 and 31, “obtainable” has been replaced with “obtained.” Accordingly, it is respectfully requested that this rejection be withdrawn.

The specification has been objected to because it contains an embedded hyperlink. Applicants would like to direct the Examiner to page 2 of the Response to the July 15, 2004, Office Action, filed January 14, 2005. In that response, the offending hyperlink was previously

deleted from the specification. Accordingly, it is respectfully requested that this objection be withdrawn.

Rejection and Objections under 35 U.S.C. §§ 102 and 103

In the Office Action, Claims 1-5, 7, 10-14, 16, 21, 23, 24 and 25 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Yutani et al. (U.S. Patent No. 5,439,980). Applicants respectfully traverse the rejection.

From a chemistry point of view, Yutani is very different from the process of the present invention, set forth in the enclosed amended claim set that have been drafted to more clearly outline this difference.

What is considered an essential difference over Yutani, is that in the presently claimed process methacrylate iodide end groups are formed. This is now reflected in amended independent claims 1 and 10. New claims 36 and 40 are also directed to this feature. By contrast, in Yutani (col. 9, lines 1 – 5) “all ends of the hydrocarbon chain segments are terminated with ethylene units ($-\text{CH}_2\text{CH}_2\text{I}$)”. The Yutani process does not yield methacrylate-iodide end groups. A further difference is that, according to the present invention, the methacrylate iodide terminated intermediate polymers act as novel degenerative iodine chain transfer agent (CTA) and can subsequently be used (as in claim 1) to form a new block copolymer.

Yutani uses ethylene or other alpha-olefins to be able to react the iodide containing compound (col. 2, lines 42 – 50). The use of the methacrylate monomer in the present invention, compared to ethylene or other alpha-olefin monomers of Yutani, is important because the intermediate polymer with an ethylene iodide end group is less reactive than with the methacrylate iodide end group.

Further, Yutani does not describe a block or gradient copolymer. The interpretation of the example 3 of Yutani as a block copolymer is incorrect. The iodide compound, even though it is a sizable compound, cannot be interpreted as the intermediate polymer of claim 1 as it does not contain methacrylate. A separate addition of MMA and AIBN is not to be seen as a new block; the ethylene pressure is still on, and the MMA is fed to compensate for used MMA. This is a procedure typical of avoiding inhomogeneity in polymers formed due to composition drift (i.e. the aim is to maintain homogeneity, rather than allowing contrasting sequences to be polymerized). For those skilled in the art, it is absolutely clear that the term block copolymer means that the blocks have a different composition. Claims 38 and 42 have been added to make clear that there is a defined block length identifiable as the intermediate polymer (block) in the block-copolymer.

In the Office Action, Claims 6, 8, 9, 15, 17, 18, and 26-35 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Yutani. Applicants respectfully traverse these rejections.

Applicants hereby incorporate the arguments made for the patentability of the claims over Yutani made above. Further, Applicants would like to point out to the Examiner that not only is the Yutani chemistry different from the present invention, but Yutani also teaches away from the present invention.

This difference is clearly shown in claims 1, 3, and 5 of Yutani. Yutani states in claim 1 that it is the radical of the M2 (alpha-olefin, per claim 3) monomer that does the abstraction of the iodine and not the M1 radical (acrylic unsaturated compound, per claim 5). In comparative examples 1 and 2, Yutani shows that MA and MMA radicals are not reactive enough to abstract the iodide end from the iodine source (the perfluorochain): the iodine remains where it is and no

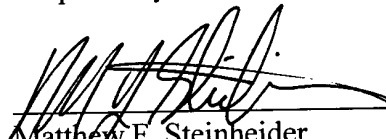
transfer occurs. Thus, Yutani, in contrast to the present invention, teaches that there is a problem with degenerative iodine transfer of methacrylates.

Further, Yutani describes that the new M2-I bond formed has "substantially the same transfer activity" as the original compound. Yutani makes it clear that he did not solve the challenges and the underlying problem of the present invention to provide for an intermediate I-block that can easily be extended by normal monomers (meth)acrylates and styrenics, as was done in the present invention.

In view of the above, Applicants respectfully request that the Examiner withdraw all rejections and objections and allow all the pending claims.

Should the Examiner find any impediment to the prompt allowance of the claims that could be corrected by a telephone interview with the undersigned, the Examiner is requested to initiate such an interview.

Respectfully submitted,



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